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Method for arranging channels in an automatic channel storage system

Described is a method for arranging channels in an automatic channel storage system. The sequence of the channels is defined as a function of observation periods of corresponding transmission signals over a predetermined period of time, and the channels are stored in a store in the defined sequence. A first of the channels stored in the store is selected automatically if a preference channel selection key is chosen by the user. To define the sequence of channels, the observation period of the transmission signal is counted when a corresponding channel is selected by keys Channel Up/Down. A check is performed of whether or not another channel has been selected in the middle of the counting process through the keys Channel Up/Down. A counting value of the observation period is stored in the store if it has been determined that the other channel has been selected by the keys Channel Up/Down. This process is repeatedly carried out over the predetermined period of time. A determination is carried out of whether the predetermined period of time has expired and the counting values of the observation periods stored in the store are arranged if the predetermined period of time has expired. The channels are stored in the store in the sequence of the arranged counting values of the observation periods.

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Specification

The present invention relates generally to video signal processing devices which are capable of receiving signals transmitted by transmitting stations, stated more precisely, a method for arranging channels in an automatic channel storage system of the video signal processing device, in which the channels are automatically arranged in the sequence selected by the user and the transmitted signals are automatically tuned in the sequence of the arranged channels.

Normally, after purchasing a video signal processing device, such as for example of a television receiver, a video recorder and the like, the user must first store the transmission receiving channels of a region in which the user is located, into the video signal processing device, for which purpose he uses either an automatic tuning process or a manual tuning process.

In the automatic tuning process the channels are arranged and stored in the sequence of the transmitted signals received over an antenna. For example, in the region of Seoul in Korea AFKN, SPS, KBS, MBC and EBS signals are received over the antenna in the sequence of channels 02, 06, 09, 11 and 13. Consequently, channels 02, 06, 09, 11 and 13 are stored in the sequence of the received transmitted signals.

In the above described automatic tuning process the channels are selected via the EBS transmitted signal of channel 13. The channel key UP must thus be pressed at least four times.

In the manual tuning process the channels are arranged and stored in the sequence specified by the user. If, for example, the MBC and SPS transmitted signal of channels 11 and 6 is specified by the user as the transmitted signal of the first and second store channel 01 and 02, the channels 11 and 6 are stored in the sequence of the first and second storage channel 01 and 02.

This manual tuning process is desirable since hereby the channel selection is made easier since the sequence of the channels is determined according to the preference of the user. However, the process has the disadvantage that the user must

make available the transmitted signal receiving channels manually one after the other which entails inconveniences.

The present invention has been conceived in view of the above described problems. It is based on the task of providing a method for arranging channels in an automatic channel storage system, in which the channels are arranged and stored in the sequence of transmission signal observation periods over a predetermined period of time, such that a desired channel can be selected immediately by the user.

Said task is solved according to the invention through a process for arranging channels in an automatic channel storage system which comprises the following steps: (a) determining the sequence of channels on the basis of observation periods of corresponding transmitted signals over a predetermined period of time and storing the channels in a store in the defined sequence; and (b) automatic selection of the first channel stored in the store if a preference channel selection key is selected by the user.

Further developments of the invention are evident on the basis of the dependent claims.

The invention will be explained in the following in further detail in conjunction with embodiment examples in connection with the drawing. Therein depict:

Fig. 1 a block circuit diagram of a video signal processing device, in which the present invention is applied;

Fig. 2 a flow chart of a process for arranging channels in an automatic channel storage system according to a first embodiment of the present invention;

Fig. 3 a flow chart of a process for arranging channels in an automatic channel storage system according to a second embodiment of the present invention; and

Fig. 4 a flow chart of a process for arranging channels in an automatic channel

storage system according to a third embodiment of the present invention.

Figure 1 shows a block circuit diagram of a video signal processing device, in which the present invention is applied. As shown in the Figure, the video signal processing device comprises a keypad 10 with a preference channel selection key, keys channel UP/DOWN and operating mode selection keys, by means of which specific operating modes of the video signal processing device can be selected.

A tuner 11 is provided in the video signal processing device, in order to tune transmitted signals received sequentially over frequency bands by an antenna. The tuner 11 tunes a desired transmission signal with respect to a channel selected by the user.

Furthermore, in the video signal processing device is provided a video program signal (VPS) detector 12, in order to detect video program signals from the transmitted signal tuned by the tuner 11. Each video program signal comprises a transmitter station code which denotes the name of a corresponding transmitter station. The signal is transmitted by placing it into a vertical blanking interval of the corresponding transmission signal.

The video signal processing device comprises further a video signal processor 13 for detecting a video signal from the desired transmission signal tuned by tuner 11 and for processing the detected video signal, a control unit 16 for controlling the overall operation of the video signal processing device and a first store 14 for storing channels and of PLL signals corresponding to them as tuning data. The first store 14 stores further the transmitter station codes of the video program signals from VPS detector 12 according to the channels stored under the control of control unit 16.

The control unit 16 counts an observation period of the desired transmission signal tuned by tuner 11 over a predetermined period of time.

The video signal processing device further comprises a second store 15 for storing a counting value of the observation period of the desired transmission signal under the control of control unit 16 and a screen display unit 17 for displaying the

selected operating mode and of the channel on a screen under the control of the control unit 17.

In the following a process will be explained for arranging channels in an automatic channel storage system of the video signal processing device of the above described design according to a first embodiment of the present invention in connection with Figures 1 and 2. Figure 2 represents a flow chart of the process for arranging the channels in the automatic channel storage system according to the first embodiment of the present invention.

After the purchase of the video signal processing device by the user, first the transmission signal receiving channels of a region in which the user is located, must be stored into the purchased video signal processing device.

For this purpose, after the apparatus is connected to the power supply, the transmission signals received by the antenna must be tuned sequentially over the frequency bands by the tuner 11 and subsequently applied to the VPS detector 12.

The VPS detector 12 detects the video program signals from the transmitted signals tuned sequentially by tuner 11 and applies the detected video program signals to control unit 16. The control unit 16 subsequently stores the transmitter station codes of the detected video program signals by VPS detector 12 in the first store 14 corresponding to the stored channels.

If subsequently the user selects on the keypad 10 a channel of a transmission signal to be observed using the keys Channel UP/DOWN, the control unit 16 generates the PLL signal according to the same channel stored in the first store 14 as the selected channel. The PLL signal from the first store 14 is applied to tuner 11 under the control of the control unit 16.

Tuner 11 tunes the transmission signal to be observed as a function of the PLL signal from the first store 14 and conducts the tuned transmission signal to the VPS detector 12, which detects the video program signal from the tuned transmission signal and applies the detected video program signal to control unit 16. The control unit 16 actuates the screen display unit 17 in order to display the channel on the screen which corresponds to the transmitter station code of the detected video

program signal.

The tuned transmission signal from tuner 11 is further applied to the video signal processor 13 such that it can be processed for display on the screen.

Control unit 16 counts the observation periods of the tuned transmission signal from tuner 11 and stores the counting value in that instant in the second store 15 in which a channel of a further transmission signal to be observed is selected by the user. In this way the counting and storing of the observation periods of the selected transmission signals is repeatedly carried out over the predetermined time period.

After passage of the predetermined time period, the control unit 16 sorts the counting values of the observation periods stored in the second store 15 in the sequence of increasing or decreasing order and stores the channels in the second store 15 in the sequence of the arranged counting values of the observation periods.

If, subsequently, the preference channel selection key is pressed on the keypad 10 by the user, the control unit 16 generates one of the PLL signals stored in the first store 14 according to the first channel stored in the second store 15 and applies the generated PLL signal on tuner 11. Consequently, the video signal tuned with respect to the first channel of the transmission signal is represented on the screen.

If, using the keys Channel UP/DOWN on keypad 10, the user selects a channel, the control unit 16 generates the PLL signal which corresponds to the same channel, stored in the first store 14 as the selected channel, and connects the generated PLL signal to tuner 11. Thus, the video signal tuned with respect to the selected channel of the transmission signal is represented on the screen.

As stated above, in the first embodiment of the present invention the channels are arranged and stored in the sequence of the transmission signal observation periods over a predetermined time period. Therefore, the channel selection can be completed rapidly through a simple actuation of the preference channel selection key on the keypad.

Figure 3 depicts a flow chart of a process for arranging channels in an automatic channel storage system according to a second embodiment of the present invention. In this embodiment the number of times the channels is selected by the

user over the predetermine time period, is stored in the second store 15. After passage of the predetermined time period, the stored numbers are arranged in increasing or decreasing order and the channels are stored in the second store 15 in the sequence of the arranged numbers.

The steps of the initial storing of the transmission signal receiving channels and the display of the video signal of the channel selected by the user on the screen of the second embodiment according to Figure 3 are the same as in the first embodiment according to Figure 2. Therefore a detailed description of these steps is omitted.

The number of times, the channels are selected by the user for the predetermined time period are subsequently stored in the second store 15, and this number, after the passage of the predetermined time period, is arranged in increasing - or decreasing - order. The channels are subsequently stored in the second store 15 in this sequence of arranged numbers.

If subsequently the preference channel selection key on keypad 10 is selected by the user, the control unit 16 generates one of the PLL signals stored in the first store 14, which corresponds to the first channel stored in the second store 15, and connects the generated PLL signal to tuner 11. Thus, the video signal of the transmission signal tuned with respect to the first channel is represented on the screen.

The channel selection step using the keys Channel UP/DOWN on keypad 10 are the same as in the first embodiment of Figure 2. A detailed description of it is omitted.

As explained above, in the second embodiment of the present invention the channels are arranged and stored in the sequence of the number of times selected by the user over the predetermined time period. The channel selection can therefore be rapidly completed by the simple actuation of the preference channel selection key on the keypad.

Figure 4 depicts a flow chart of a process for arranging channels in an automatic channel storage system according to a third embodiment of the present

invention. In this embodiment a specific channel and a specific televiewing time are stored in the second store 15 when the user selects the specific channel in order to view a specific program of the specific televiewing time.

The steps for the initial storage of the transmission signal receiving channels and for reproducing the video signal of the user-selected channel on the screen of the third embodiment of Figure 4 are the same as in the first embodiment of Figure 2. Therefore a detailed description of these steps is omitted.

If the user subsequently selects a specific channel in order to view a specific program at a specific televiewing time the specific channel and the specific time are stored in the second store 15.

The above process is carried out repeatedly over the predetermined time in order to store in the second store 15 the channels and the time of the programs frequently viewed by the user for the given time.

If subsequently the preference channel selection key on the keypad 10 is selected by the user, the control unit 16 generates the PLL signal which corresponds to the specific television time as instantaneous time stored in the second store 15, and connects the generated PLL signal with the tuner 11. Consequently, on the screen the video signal of the transmission signal is represented which had been tuned with respect to the channel of the same specific televiewing time as the instantaneous time.

The transmission signal tuned by tuner 11 is further connected to the VPS detector 12, which detects the video program signal from the tuned transmission signal and connects the detected video program signal to the control unit 16. The control unit 16 subsequently actuates the screen display unit 17 in order to display the channel on the screen which corresponds to the transmitter station code of the detected video program signal.

Thus, according to the third embodiment of the present invention the channel of the specific program can be immediately selected at the specific televiewing time.

As is evident based on the above description, according to the invention the channels are arranged and stored on the basis of the observation periods, the selected number of times or the televiewing time of the specific programs. The channel

selection can therefore be accomplished rapidly and without difficulties by simply actuating the keypad.

Patent Claims

1. Method for arranging channels in an automatic channel storage system, **characterized by** the following steps:
 - (a) determining the sequence of the channels on the basis of observation periods of corresponding transmission signals over a predetermined time period and storing the channels in a store in the determined sequence, and
 - (b) automatically selecting a first of the channels stored in the store if a preference channel selection key is selected by the user.
2. Method as claimed in claim 1, characterized in that step (a) for storing the channels comprises the following steps:
 - (a-1) Counting the observation periods of the transmission signal if a corresponding channel has been selected by keys Channel UP/DOWN;
 - (a-2) Checking whether or not another channel has been selected by the keys Channel UP/DOWN in the middle of the counting process in step (a-1);
 - (a-3) Storing a value of the observation periods counted in step (a-1) in the store if it was determined in step (a-2) that the other channel had been selected by the keys Channel UP/DOWN; and
 - (a-4) Repeatedly carrying out steps (a-1) to (a-3) over a predetermined time period, checking whether the predetermined time period has passed, arranging the counting values of the observation periods stored in the store if it was determined that the predetermined time period has passed, and storing the channels in the store in the sequence of the arranged counting values of the observation periods.

3. Method as claimed in claim 1 or 2, characterized in that step (b) for the automatic selection of a first channel comprises the following steps:
 - (b-1) Checking whether or not the preference channel selection key has been selected by the user, and displaying the transmission signal, tuned with respect to the first channel stored in the store, with a monitor if it was determined that the preference channel selection key was selected by the user, and
 - (b-2) Displaying the transmission tuned with respect to one of the channels selected by keys Channel UP/DOWN with the monitor if it was determined that the preference channel selection key had not been selected by the user.
4. Method as claimed in claim 2 or 3, characterized in that the counting values of the observation periods stored in the store in step (a-4) are arranged in decreasing order.
5. Method as claimed in claim 2 or 3, characterized in that the counting values of the observation periods stored in the store in step (a-4) are arranged in increasing order.
6. Method as claimed in claim 1, characterized in that step (a) for storing the channels comprises the following steps: counting the number of times which the channels have been selected by the user over the predetermined time period, arranging counting values of the number of times in decreasing or increasing order after passage of the predetermined time period, and storing the channels in the store in the sequence of the arranged counting values of the number of times.

7. Method as claimed in claim 1, characterized in that step (a) for storing the channels comprises the following steps: storing specific channels and specific televiewing times which correspond to these, in the store over a predetermined time period and arranging the stored specific channels and televiewing times in the viewing frequency by the user.

4 sheets of drawing enclosed

FIG .1

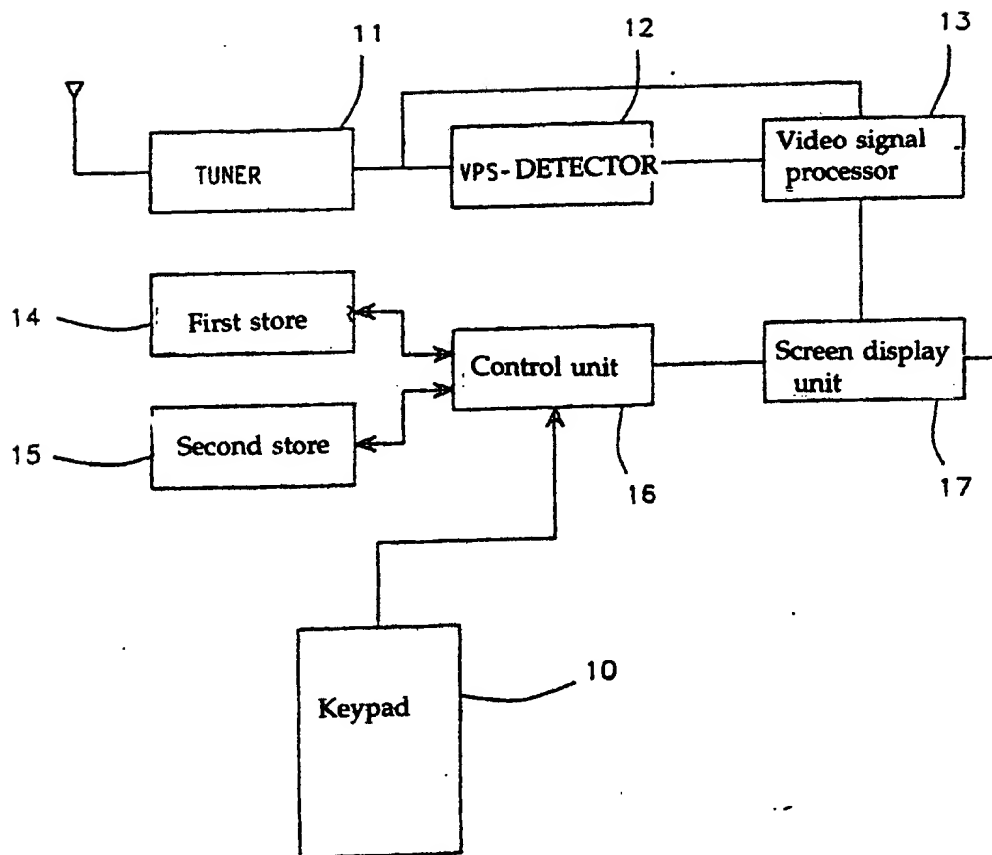


FIG. 2

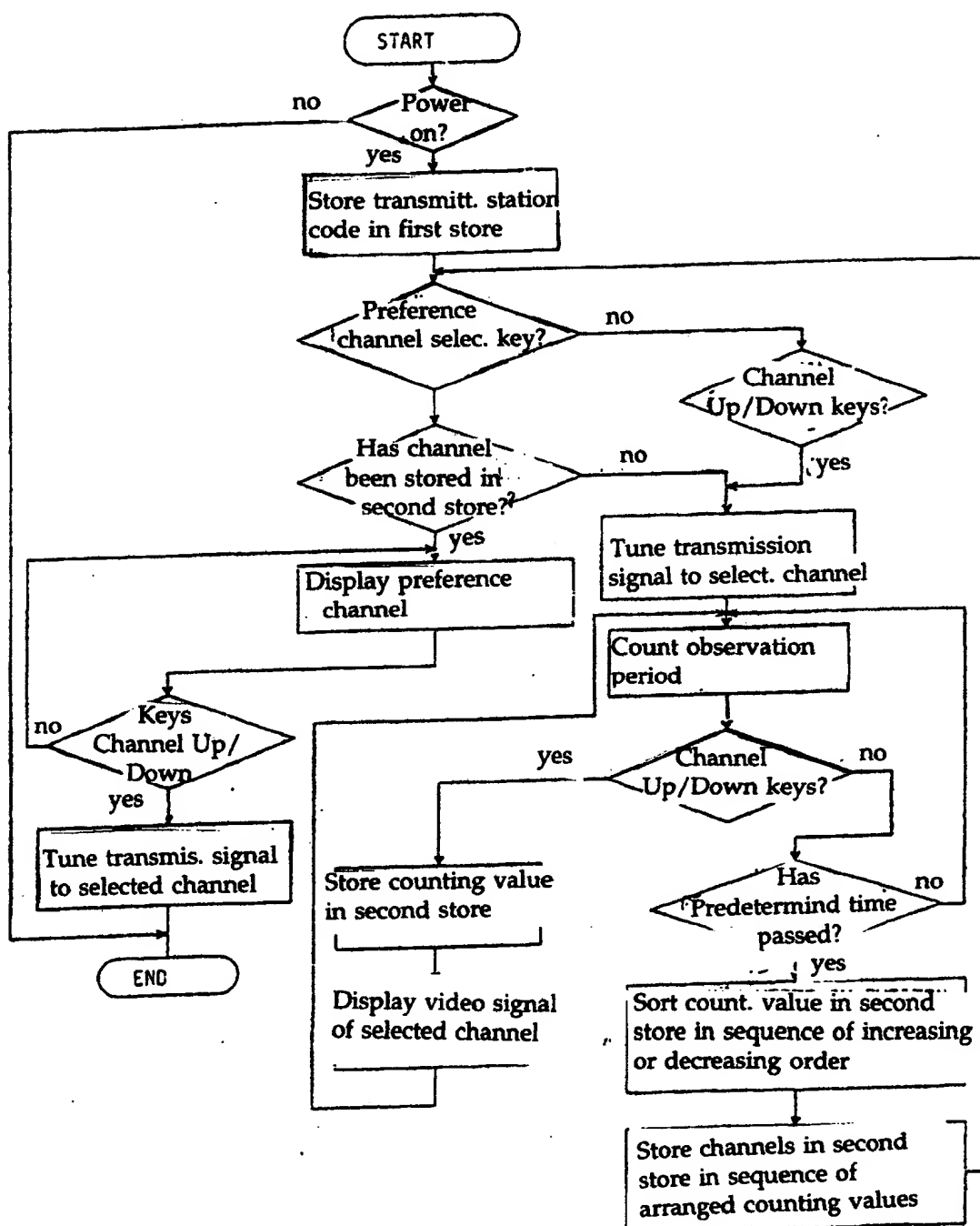


FIG .3

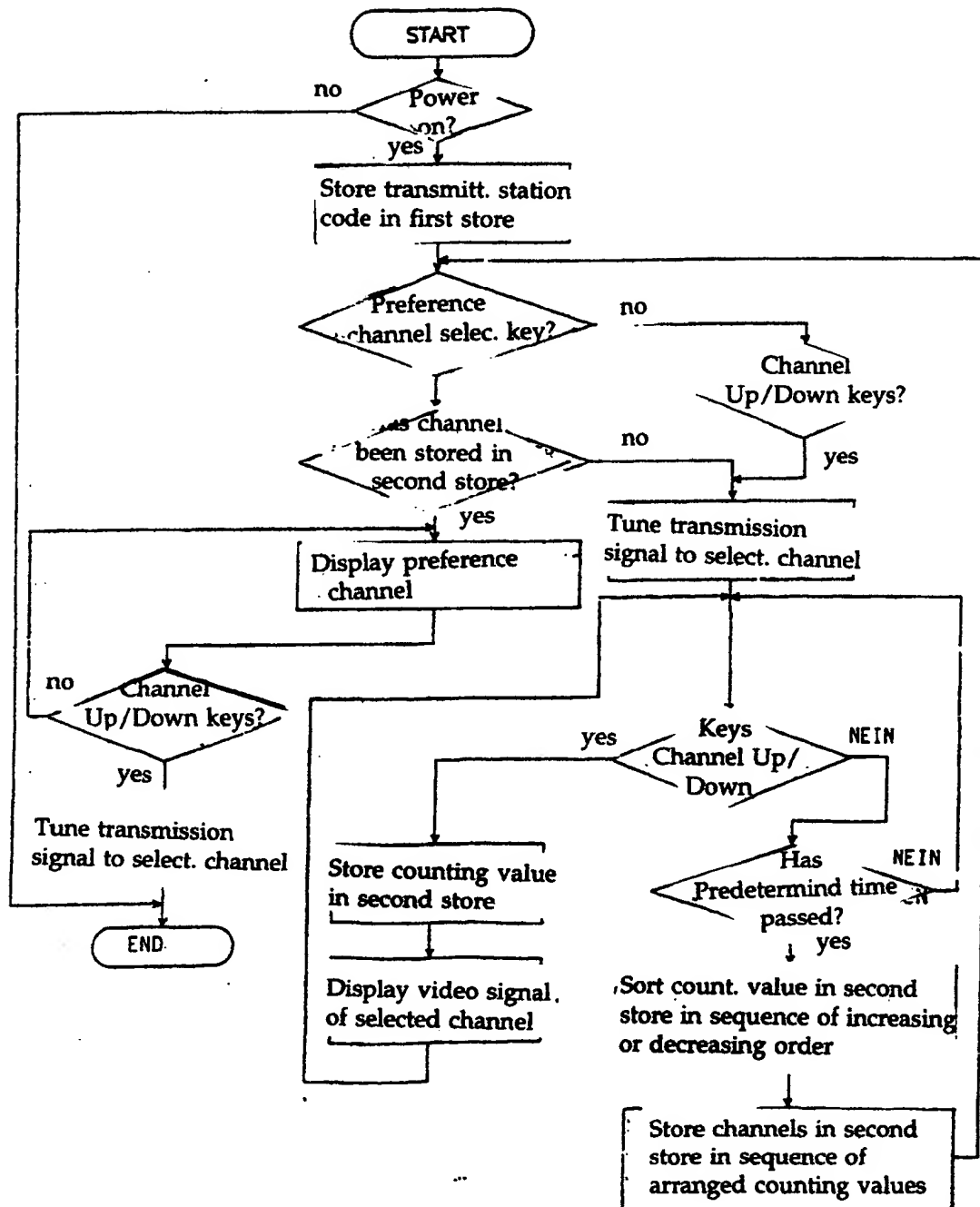
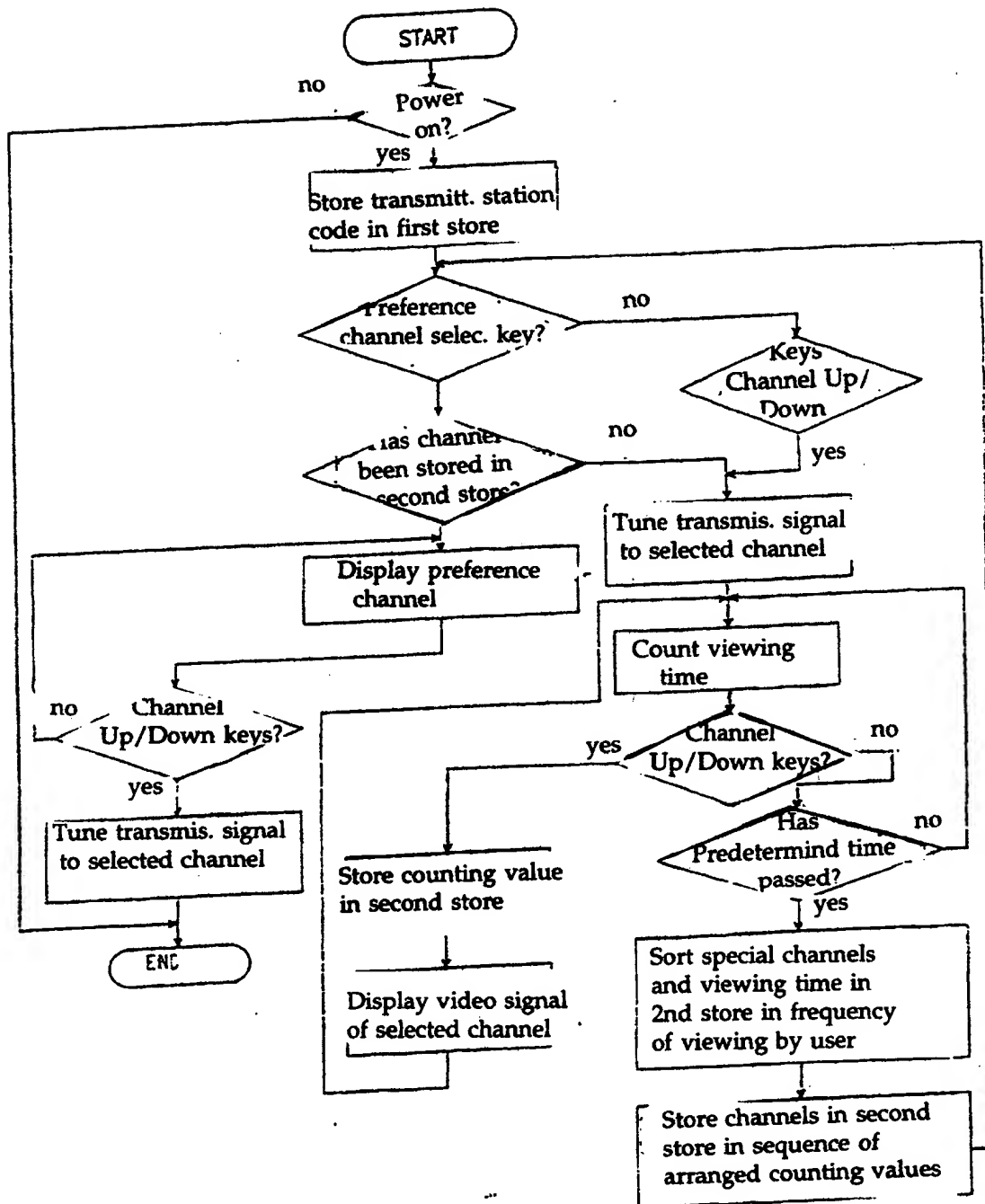


FIG. 4



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